Claims

1. A process for producing a supported catalyst which comprises at least 75% by weight of Al_2O_3, whose proportion of Al_2O_3 in the delta or theta modification is, based on the proportion of Al_2O_3, at least 1% and which comprises a rhenium compound and, if appropriate, a promoter as active component (A), which comprises

   a) converting a customary support (S) which comprises at least 75% by weight of Al_2O_3 and to which a promoter may, if appropriate, have been applied is converted into a modified support (S) whose proportion of Al_2O_3 in the delta or theta modification is, based on the proportion of Al_2O_3, at least 1% by calcining the customary support (S) at a temperature of from 750 to 1100°C,

   b) producing a supported catalyst precursor from the modified support (S) by applying the active component (A) comprising the rhenium compound to the modified support (S) and

   c) calcining the supported catalyst precursor at a temperature of from 500 to 750°C.

2. The process according to claim 1, wherein the total proportion of Al_2O_3 in the delta or theta modification is, based on the proportion of Al_2O_3, at least 10%.

3. The process according to claim 1 or 2, wherein the proportion of Al_2O_3 in the theta modification is, based on the proportion of Al_2O_3, at least 10%.

4. The process according to any of claims 1 to 3, wherein the support (S) comprises Al_2O_3 together with components selected from the group consisting of SiO_2, aluminosilicates, TiO_2, ZrO_2, MgO, CeO_2 and ZnO.

5. The process according to any of claims 1 to 3, wherein the amount of rhenium compound used as active component (A) in step b) is selected so that the catalyst comprises from 0.01 to 1 mmol of rhenium per gram of catalyst.

6. The process according to any of claims 1 to 5, wherein the supported catalyst has an XRD spectrum in which the maximum of the most intense reflection (main reflection) is in the range from 2 theta > 66° to 2 theta < 68° and the maximum of one additional reflection or the maxima of a plurality of additional reflections (secondary reflection) are in the range from 2 theta > 32.5° to 2 theta < 37.4° and

5 drawings

the intensity ratio of the respective secondary reflection to the main reflection is at least 0.05.

7. The process according to any of claims 1 to 6, wherein the starting materials are selected so that the total amount of alkali metal compounds, calculated as alkali metal, in the supported catalyst is less than 1000 ppm by weight.

8. The process according to any of claims 1 to 7, wherein the starting compounds are selected so that the total amount of cesium compounds, calculated as elemental cesium, in the supported catalyst is less than 50 ppm by weight.

9. A process for preparing a compound having a nonaromatic C-C double bond or C-C triple bond (compound A) from another compound or mixture of other compounds having a nonaromatic C-C double bond or C-C triple bond (compound B), which comprises bringing the compound (B) into contact with a supported catalyst according to any of claims 1 to 8 at a temperature of from 50 to 500°C.

10. The process according to claim 9, wherein compound (B) is 1-butene or a mixture of butenes comprising 1-butene.

11. A supported catalyst obtainable according to claim 7 or 8.

5 drawings